Interim Action Plan

Chevron Site No. 30-2095
Former Chevron Bulk Terminal
149 and 167 Main Avenue
Morton, Washington

September 20, 2005

Prepared for:

Chevron

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1.0 INTRODUCTION

This interim action plan (IAP) is being submitted pursuant to Section IV(2) of Enforcement Order DE03TCPSR5715 between the Washington State Department of Ecology (Ecology), Chevron Products Company (Chevron), Dana and Diana Wolfe, and Janet Parks. This plan was prepared on behalf of Chevron by Science Applications International Corporation (SAIC) in accordance with Washington Administrative Code (WAC) 173-340-430(7). This plan describes an interim action to be conducted at Chevron facility 30-2095, a former Standard Oil Company of California (Standard Oil) petroleum bulk terminal located in Morton, Washington (the site).

2.0 SITE BACKGROUND

Standard Oil constructed the former bulk terminal in 1924 near the intersection of Main Avenue and First Street on property leased from Chehalis Western Railroad (Figure 1). The terminal was fenced and included six vertical above-ground storage tanks (ASTs) (two 19,000-gallon, one 13,000-gallon, and three 6,000-gallon tanks) for gasoline, diesel, kerosene, and heating oil. The terminal also included tank truck and rail car unloading headers (TTUHs and TCUHs), tank truck loading racks (TTLRs), and a pump house. Other structures included a 2,500-square foot warehouse, part of which was used as a garage and part of which was used to handle drummed product, and a 300-square foot office building (Figure 2).

From 1924 until the mid-1950s the terminal was supplied by rail. Rail tank cars were positioned on a railroad spur located southwest of the warehouse and unloaded via the TCUHs. The facility was later modified to allow unloading of tank trucks via TTUHs located near the ASTs. In 1971 a tank truck loading area was constructed to the east of the warehouse. The terminal operated until the late 1970s. Around 1981 the ASTs, piping, pumps, and headers were removed from the site. The warehouse and office building were left intact and remain on the site.

In 1985 the property on which the terminal was located, which consisted of two separate parcels, was sold to Pacific Fire Trails. Pacific Fire Trails did not develop the property and, in 1993, sold it to Dana and Diana Wolfe. The Wolfes soon after sold the western parcel to Janet Parks. The Parks parcel contains a 5,000-square foot building, which currently houses a thrift store (Jan's Lost & Found). This structure existed during the period the bulk terminal was in operation; however, it was located outside of the terminal fence and was not associated with terminal operations. The warehouse and office building from the former bulk terminal are still located on the eastern parcel. Adjacent properties are owned by Chester Walker and the City of Tacoma (Figure 2).

In 2003 a citizen reported to Ecology that a fuel odor had been noted during an excavation at the site in the early 1980s. Lewis County Health Department, in conjunction with Ecology, conducted an initial investigation and identified petroleum-contaminated soil at several locations. Based on these findings, Ecology issued Enforcement Order DE 03TCPSR-5715 to Chevron, Dana and Diana Wolfe, and Janet Parks on January 20, 2004, requiring the parties to investigate and clean up petroleum contamination at the site. Chevron initiated a remedial investigation, described below, in May 2004.

In June 2005 the CRVHS acquired the eastern parcel of the former terminal site from Dana and Diana Wolfe. The CRVHS plans to develop the property as a tourist facility featuring a renovated historical railway depot. Plans call for an existing partially restored depot building to be moved onto the site in late 2005. Future development plans for the property include construction of a parking area, museum, and restrooms.

3.0 SUMMARY OF REMEDIAL INVESTIGATION

In accordance with the enforcement order, SAIC prepared a remedial investigation (RI) work plan (SAIC 2004). The work plan was reviewed and approved by Ecology. RI activities, including a soil and groundwater investigation, began in May 2004. Sample locations are shown on Figures 3 and 4, and investigation activities are outlined below:

- May 17 – June 8, 2004: Thirty-nine soil borings (SB-1 through SB-39) were installed and sampled in order to define the nature and extent of soil contamination.

- June 28 – July 9, 2004: Four monitoring wells, MW-1 through MW-4, were installed, developed, sampled, and surveyed in order to evaluate groundwater contamination and to define the hydraulic gradient.

- September 14 – October 1, 2004: Eight additional monitoring wells, MW-5 through MW-12, were installed, developed, and surveyed and borings SB-46 through SB-48 and SB-51 through SB-55 were installed and sampled to further define contamination at the site.

The 12 monitoring wells were sampled four times during quarterly sampling rounds conducted on October 11, 2004; January 13, 2005; April 11, 2005; and July 11, 2005. In addition, monthly depth-to-water measurements were taken in all wells to assess seasonal variations in water-table elevation and gradient.

3.1 Soil Sampling

A total of 55 soil borings were completed on the site. Soil borings were advanced with a hand auger for at least the first eight feet; below this depth, borings were advanced either by hand auger or with a geoprobe rig. Soil borings drilled for the installation of monitoring wells were advanced using a hollow-stem auger. Borings were geologically logged and field screened for organic vapors with a photoionization detector (PID). In general, borings were advanced to depths of 12 to 16 feet, well beyond the limits of detectable contamination in most locations. Borings SB-3, SB-34, and SB-39 were advanced to 24 to 28 feet in order to characterize deeper stratigraphy.

At least one sample from the most highly contaminated interval (based on field observations and measurements) was collected from each boring for laboratory analysis. Additional samples were collected in borings where contamination was present in multiple and/or lengthy intervals. All samples were analyzed by an Ecology-certified laboratory, Lancaster Laboratories, Lancaster, Pennsylvania. Laboratory reports are presented in Appendix B.

Samples from the initial 39 soil borings, SB-1 through SB-39, were analyzed for the following parameters:

- Gasoline-range organics (GRO) by method NWTPH-Gx
- Diesel-range organics (DRO) by method NWTPH-Dx
- Heavy-oil range organics (ORO) by method NWTPH-Dx
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by method 8260
- Ethylene dibromide (EDB or 1,2-DBA) by method 8260
- Ethylene dichloride (EDC or 1,2-DCA) by method 8260
- Methyl tertiary-butyl ether (MTBE) by method 8260
- Lead by method 7421

Approximately 20 percent of the boring, representing the most highly contaminated samples, was analyzed for the following additional parameters:

- Polychlorinated biphenyls (PCBs) by method 8082
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by method 8270
- Napthalenes by method 8260
- n-hexane by method 8260
- Halogenated VOCs by method 8260
- Volatile petroleum hydrocarbons by (VPH) method WA-VPH
- Extractable petroleum hydrocarbons (EPH) by method WA-EPH

Based on the results from soil samples collected from the initial 39 borings, GRO, DRO, ORO, and BTEX compounds were identified as the contaminants of potential concern for the site and analyses of samples from subsequent soil samples were limited to these parameters.[1]

3.2 Groundwater Sampling

A total of 12 monitoring wells were installed on the site. A hollow-stem auger drill rig was used to install the monitoring wells. All monitoring wells were completed at a depth of 20 feet and were screened from 5 to 20 feet. Monitoring wells were sampled with a peristaltic pump and dedicated sample tubing. Samples were collected from within the screened zones using low-flow rates to minimize drawdown and turbulence. During purging, groundwater was routed through a closed flow cell, which allowed temperature, dissolved oxygen (DO), pH, specific conductance, and turbidity to be monitored. Wells were purged until field parameters stabilized. All samples were analyzed by an Ecology-certified laboratory, Lancaster Laboratories, Lancaster, Pennsylvania.

Groundwater samples collected on July 9, 2004, from the first four wells installed at the site, MW-1 through MW-4, were analyzed for the following parameters:

- GRO by method NWTPH-Gx
- DRO by method NWTPH-Dx
- ORO by method NWTPH-Dx
- Benzene, toluene, ethylbenzene, xylenes (BTEX)
- Ethylene dibromide (EDB) by method 8260
- Ethylene dichloride (EDC) by method 8260
- Methyl tertiary-butyl ether (MTBE) by method 8260
- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by method 8270.
- Napthalenes by method 8260
- n-hexane by method 8260
- Dissolved Lead by method 7421
- Polychlorinated biphenyls (PCBs) by method 8082

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[1] EDB, EDC, MTBE, PCBs, cPAHs, naphthalenes, n-hexane, and halogenated VOCs were not detected in any of these soil samples above MTCA cleanup levels. With one exception, lead concentrations were all well below the cleanup level of 250 mg/kg. Lead was detected at a concentration of 918 mg/kg in boring SB-15 at a depth of two feet. This exceedance did not coincide with significant petroleum contamination and was judged to be spurious and/or unrelated to past petroleum leaks or spills. This exceedance will not affect the planned interim action, but will be considered at a later time.

Based on the results of groundwater samples collected during this round, GRO, DRO, ORO, and BTEX compounds were identified as the contaminants of potential concern for the site and analyses of samples from subsequent groundwater monitoring rounds were limited to these parameters.[2]

3.3 Hydrogeology

Soil borings indicated that the site is underlain by unconsolidated materials consisting of fill and alluvial deposits. Figure 5 presents an east-west geologic cross-section of the site. The uppermost unit at the site is fill that typically ranges between one to four feet in thickness, but is absent in places. The fill consists of poorly sorted silt, sand, and gravel. Below the fill is a sequence of mottled silts and clays, organic-rich in places, that is split by a thin sand and/or sandy gravel layer. The coarse-grained unit occurs at a depth of between 8 to 12 feet and is continuous across a portion of site. The lower units that have been investigated at the site consist mostly of thinly interstratified silts and sands.

During drilling, saturated conditions were usually first encountered at depths of 5 to 10 feet within the coarser-grained sediments. Often, saturated sands were sandwiched between unsaturated silty units. Once installed, water levels in the monitoring wells typically stabilized at between one and six feet below land surface suggesting the presence of some local, semi-confined conditions.

A series of depth-to-water measurement rounds conducted over a 12-month period indicated that the water-table at the site, as defined by the water levels in the monitoring wells, is irregular and variable. This situation is typical of sites dominated by local recharge and conditions where wells tap multiple, discontinuous, and/or perched water-bearing zones. Representative water-table elevation contours are shown on Figure 6. The contoured data sometimes shows a groundwater ridge or mound over the central portion of the site in the vicinity of MW-2, MW-10 with gradients to the northeast and south-southwest; at other times, the water table exhibits a simpler configuration with a gradient to the southwest. Given the discontinuous nature of the water-bearing zones at the site, the groundwater gradients constructed from depth-to-water measurements may not reflect actual groundwater flow paths.

3.4 Nature and Extent of Contamination

3.4.1 Indicator Contaminants

As discussed in Sections 3.1 and 3.2, GRO, DRO, ORO, and BTEX compounds were identified as the contaminants of potential concern for the site. Of these, ORO, ethylbenzene, toluene, and xylenes did not exceed MTCA Method A cleanup levels in environmental samples. Therefore, GRO, DRO, and benzene are defined as indicator contaminants. Tables 1 and 2 summarize the results for the indictor contaminants in soil and groundwater, respectively.

3.4.2 Soil Contamination

GRO is the most widespread contaminant at the site occurring in concentrations exceeding 300 mg/kg (>10 times Method A cleanup level) throughout the AST area, between the AST area and the railroad

[2] EDB, MTBE, PCBs, cPAHs, naphthalenes, n-hexane, and halogenated VOCs were not detected in any of these groundwater samples above MTCA cleanup levels. With one exception, EDC concentrations were also less than the cleanup level. EDC was detected at a concentration of 10 µg/L in well MW-3 (compared with the cleanup level of 5 µg/L). Because of the limited magnitude and frequency of this exceedance and the finding that EDC was not detected in site soil above its cleanup level, additional analyses for EDC were not performed. This exceedance will not affect the planned interim action, but will be considered at a later time.

tracks, beneath the northern portion of the warehouse, and to the south and southeast of the warehouse (Figure 7). Soil contamination in these areas is consistent with spills and leaks of petroleum products during historical terminal operations. High concentrations of GRO in soil were also found in two samples beneath the west portion of the thrift store and in one sample immediately adjacent to the south side of the thrift store. Historical records indicate that this structure was formerly a feed warehouse and do not indicate that it was ever part of the bulk terminal operations; the source of GRO in these samples is not clear.

The extent of DRO and benzene (Figures 8 and 9) contamination is much more restricted than GRO and is generally limited to the AST area between the former ASTs and the railroad tracks. The area of DRO and benzene contamination in soil is encompassed by the area of GRO contamination.

Based on analytical results and field observations, the main vertical zone of soil contamination occurs within the probable range of seasonal water-table fluctuation. Soil contamination typically is first encountered at a depth of about two feet and is limited to a maximum depth of six to eight feet in most places. Contaminants were detected to somewhat greater depths in SB-43 (10 feet) and SB-39 (12 feet).

3.4.3 Groundwater Contamination

In general, the extent of groundwater contamination lies within the zone of soil contamination (Figures 10 through 12). The most significant groundwater contaminants relative to Method A cleanup levels are benzene and GRO. The most significant exceedances of these two contaminants typically occur in three monitoring wells: MW-2 (just south of the former AST area), MW-4 (near the former TCUH), and MW-10 (between the AST area and the railroad tracks). Lower and/or less-frequent exceedances have also been observed in MW-6, MW-8, and MW-3. The affected monitoring wells are located adjacent to or downgradient from former bulk terminal facilities. For example, MW-2 and MW-10 are located near or downgradient of the AST area and MW-4 is located near the former TCUH.

4.0 DESCRIPTION OF INTERIM ACTION

The planned site development activities will involve transporting an existing building (an historic rail depot) onto the south-central portion of the site where it will be placed on temporary cribbing. A suitable foundation will be constructed beneath the building and the depot will be lowered onto the foundation. Following this, an elevated platform will be constructed around a portion of the perimeter of the depot. The interim action will be performed prior to the building move and will involve excavating contaminated soil beneath the footprint of the depot and platform area, properly disposing of the excavated soil, collecting and analyzing performance monitoring samples, and backfilling the excavation with clean, compacted material. The interim action is scheduled to occur in mid-October 2005.

4.1 Objectives

The enforcement order specifies a process and schedule for the selection and implementation of final cleanup actions at the site. However, the depot move schedule does not allow adequate time for this process. Therefore, the interim action is being conducted in advance of final cleanup action using the interim action process outlined in MTCA. As required, the interim action meets the criteria set forth in subsections (1), (2), and (3) of WAC 173-340-430 by having the following characteristics:

- The interim action is being conducted because the contamination would cost substantially more to address once the planned development is completed and contaminated soil will be difficult to access.
- The interim action is expected to achieve soil cleanup standards for a portion of the site.

- The interim action will not foreclose reasonable alternatives for the final cleanup action.

4.2 Scope of Work

The interim action will involve a number of activities, which are described in the following subsections.

4.2.1 Obtain Permits and Notifications

SAIC will apply for required permits and make the necessary notifications to the relevant jurisdictions to conduct the interim action. These include:

- Fill and Grading Permit – Lewis County
- Wastewater Discharge Permit – Lewis County
- State Environmental Policy Act (SEPA) Checklist – City of Morton
- Notice of Intent for Well Decommissioning – Washington State Department of Ecology

4.2.2 Address Utilities

A minimum of 48 hours prior to beginning excavation, SAIC will notify the Utilities Underground Location Center ("one-call") to locate and mark underground utilities. SAIC will also arrange for a private locating service (Applied Professional Services [APS]) to locate and mark any underground utilities that may not have been marked by the one-call service. In addition, overhead utilities (e.g., power and telephone) will be assessed to see if they will interfere with excavation. If so, the relevant utility companies will be notified and the lines will be temporarily relocated.

4.2.3 Decommission Monitoring Well MW-10

Monitoring well MW-10, which lies within the proposed remedial excavation, will be decommissioned prior to remedial excavation. The well will be decommissioned by filling the casing with bentonite pellets from the bottom of the well to the land surface. This work will be conducted or overseen by a Washington-state licensed driller or a professional engineer.

4.2.4 Excavate Contaminated Soil

Access control. The work area, including the excavation, soil stockpile, and load-out areas, will be fenced with temporary chain-link fencing.

Excavation. Contaminated soil beneath the footprint of the depot and platform areas will be excavated and disposed of. This work will be performed by Chevron's subcontractor, Pacific Northern Environmental Corporation (PNE), and overseen by SAIC. Based on information from the RI, we anticipate that the excavation will need to be at least six feet deep in order to remove all impacted soil exceeding Method A cleanup levels. Because contaminated soil was detected to a depth of 12 feet in soil boring SB-39, located at the extreme west end of the depot footprint, the western portion of the excavation may to 12 feet or more.

Soil excavation will proceed outward at an approximately 1:1 slope, or shallower, to the footprint of the depot and platform areas (Figure 13). The excavation will proceed vertically until field observations (odor, sheen, staining, and PID headspace readings) indicate the vertical extent of soil contamination has been reached. Performance monitoring samples will be collected from the bottom of the excavation for chemical analysis as described below in Section 5.0.

Soil Disposal. It is estimated that approximately 1,000 cubic yards of petroleum-contaminated soil will require removal and disposal. The soil will be trucked to the Waste Management, Inc. (WMI) transfer station in south Seattle, where it will be shipped via rail to the Roosevelt Regional Landfill in southeastern Washington.

Soil stockpiling. Excavated soil that is not loaded directly into trucks for transport will be stockpiled on site for subsequent load out. RI results indicate that approximately two feet of clean soil overlies contaminated soil at the site. If possible, this soil will be excavated and stockpiled separately for use as backfill. The segregation of this soil will be based on field observations.

Environmental controls. Stockpiled soil will be placed within a temporary bermed area lined with plastic sheeting and will be covered with plastic at the end of each day to prevent erosion and runoff. In addition, catch basins in the vicinity of the excavation work area will be lined with a filter fabric to prevent the introduction of fine soils and debris into surface water. Straw bales may be used to prevent any offsite transport of contaminated runoff. Dust will be addressed with water spray, if necessary.

Dewatering. Given the shallow water table, we anticipate that some dewatering will be necessary. The water will be discharged to the municipal sanitary sewer system via a nearby manhole. The rate of discharge and pretreatment and/or acceptance requirements, if any, will be specified in the wastewater discharge permit. This permit is currently pending. Permit requirements will be attached to this workplan when they are finalized.

Confirmation sampling. Once field observations indicate that excavation is complete, a number of soil samples will be collected from the base of the excavation and analyzed by a mobile on-site laboratory to document that the contaminated material has been removed beneath the depot footprint. Samples will also be collected from the excavation sidewalls and from the clean-soil stockpile. The performance monitoring program is described more fully in Section 5.0. If confirmation sampling indicates that remediation levels have not been met at the base of the excavation, additional soil will be removed and additional samples will be collected.

Backfilling. After the excavation has been completed and adequately documented with results of performance monitoring samples, the excavation will be backfilled. Quarry rock, or equivalent, will be placed in the base of the excavation. This will be followed by compactable backfill material, including suitable non-contaminated soil from the excavation. Backfill will be brought to the grade and degree of compaction required for construction of the depot foundation.

4.3 Health and Safety

The interim action will be conduced in accordance with approved site-specific health and safety plans (HSPs) and journey-management plans (JMPs). These documents are being submitted under separate cover and are incorporated herein by reference.

5.0 PERFORMANCE MONITORING

5.1 Approach

Performance monitoring will be conducted to confirm that the interim action has achieved remediation levels. Remediation levels for this action will be considered met if excavation-bottom soils meet Method A levels for the indicator contaminants identified in Section 3.4.1, GRO, ORO, and benzene, using the statistical evaluation method outlined in WAC 173-340-740(7)(d)(i). The use of Method A cleanup levels as interim action remediation goals is appropriate at this site because the site is undergoing routine cleanup action and has relatively few hazardous substances.

Additional samples will be collected from the clean-soil stockpile and from the excavation sidewalls. These samples will be used to confirm that stockpiled material is suitable for backfill and to document the concentration of contamination remaining at the lateral limits of the excavation, respectively. However, these samples will not be used to determine whether the interim action has achieved remediation levels.

5.2 Sample Collection

Once field observations indicate that contaminated soil has been removed from beneath the depot footprint, at least five discrete, evenly spaced soil samples will be collected from the bottom of the excavation. The samples will be obtained from the excavator bucket using care to collect material from the middle of the bucket to avoid cross-contamination.

An additional five discrete soil samples will be collected from the clean soil stockpile to confirm that this material meets remediation levels and is suitable to be used for backfill. These samples will be evenly spaced within the stockpile and will be collected using a hand auger from a depth of approximately one foot.

At least six discrete samples will also be collected from the excavation sidewalls in order to characterize remaining contaminant levels in soil beyond the lateral limits of excavation.

Samples will be collected in glass jars. Sample locations will be noted in the field logbook and on the site map. All samples will be properly labeled and hand-carried to the mobile analytical laboratory under appropriate chain-of-custody procedures.

5.3 Analytical Methods

Samples will be analyzed by an Ecology-approved mobile on-site laboratory operated by ESN Northwest. The following analytical methods will be used:

- GRO by method NWTPH-Gx
- DRO by method NWTPH-Dx
- Benzene by method 8021

The RI Workplan (April 2004) specifies quality assurance/quality control procedures for sample analyses. These procedures are incorporated by reference into this interim action plan.

6.0 REPORTING

Following the interim action, SAIC will prepare a brief Interim Action Report that documents the field activities, analytical results, and results of the performance monitoring evaluation.